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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PHAN, HAI	
ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/821,547	DIEDRICHSEN, STEFFAN	
	Examiner	Art Unit	
	Hai Phan	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 16-26* is/are rejected.

7)☒ Claim(s) *3-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 February 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Applicants' communication filed on 02/16/2010. In virtue of this communication, claims 1-26 are currently pending in the instant application.

Drawings

2. The correction to the drawings to include the label "(PRIOR ART)" was received on 02/16/2010. These drawings are acceptable.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 18, 20-21, 23-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlbom et al (U.S. Patent 6,751,322, hereinafter referred to as Carlbom) in view of Ito (U.S Patent 7,217,879; hereinafter referred to as Ito).

Regarding claims 1, 18, 21, Carlbom discloses a system and the corresponding method for convolving the audio signal with the multi-channel impulse responses (Fig. 15, col. 11, lines 43-61) comprising the convolution engine (element 19) and impulse response synthesizer (impulse response element that outputs kx1). Carlbom fails to

disclose that the impulse response information is customizable by a user. However, Ito teaches the system and method for generating impulse response data where such data can be changed by the user (Fig. 1 and col. 5, line 60 to col. 6, line 7). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the customization feature to the impulse response data as taught by Ito into the system and method of Carlbom's because this would reduce the storage capacity for storing impulse response data (col. 6, lines 1-3).

Regarding claim 24, Carlbom further teaches that his invention can be implemented by the computer system (col. 12, lines 30-33).

Regarding claims 20, 23, and 26, Carlbom further shows the convolution is performed on the audio signal (col. 11, lines 43-46).

5. Claims 1-2, 18, 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sloan (U.S. Patent 4,989,158) in view of Ito (U.S Patent 7,217,879; hereinafter referred to as Ito).

Regarding claims 1, 18, and 21, Sloan discloses a device (Fig. 6) comprising the impulse-response synthesizer (element 40 and 42) and the convolution engine (elements 72 and 74). Sloan fails to disclose that the impulse response information is customizable by a user. However, Ito teaches the system and method for generating impulse response data where such data can be changed by the user (Fig. 1 and col. 5, line 60 to col. 6, line 7). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the customization feature to the impulse response data as taught by Ito into the system and method of

Sloan's because this would reduce the storage capacity for storing impulse response data (col. 6, lines 1-3).

Regarding claim 2, Sloan further teaches the impulse-synthesizer comprises a noise synthesizer (element 40) and control means (the shift register 42) which shifts the noise generated by generator 40, thus interpreting as controlling the one or more parameters of the noise synthesizer.

Regarding claim 24, Sloan further teaches the method of synthesizing noise and performing convolution are implemented by a programmable computer (see col. 15, lines 26-28).

6. Claims 1, 18, 20-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted Prior Art in view of Ito (U.S Patent 7,217,879; hereinafter referred to as Ito).

Regarding claims 1, 18, 20-21, and 23, Applicant admitted in the current disclosure that the system and method for generating artificial reverberation as recited in these claims (see Fig. 1 and specification, para 0002, lines 6-13 and para 0008). Applicant's admitted Prior Art fails to disclose that the impulse response information is customizable by a user. However, Ito teaches the system and method for generating impulse response data where such data can be changed by the user (Fig. 1 and col. 5, line 60 to col. 6, line 7). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the customization feature to the impulse response data as taught by Ito into the system and method of

Applicant's admitted Prior Art's because this would reduce the storage capacity for storing impulse response data (col. 6, lines 1-3).

7. Claims 19, 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sloan (U.S. Patent 4,989,158) in view of Amano et al (U.S. Patent 7,130,799) as applied to claims 18, 21 and 24 above, and further in view of Amano et al (U.S. Patent 7,130,799).

Regarding claims 19, 22, and 25, in addition to the combination of Sloan and Ito as explained in rejecting claims 18, 21 and 24 above, Sloan further teaches the method of synthesizing noise and performing convolution are implemented by a programmable computer (see col. 15, lines 26-28). Sloan also discloses that the noise generator is the pseudo random noise generator (element 40). The combination fails to teach the means for filtering noise from the noise generator and means for generating signal envelope from the filtered noise. However, Amano discloses a speech synthesis device and method thereof (see Fig. 1) including the filter (24) and amplitude adjuster (25) connected sequentially to the output of the noise generator. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the filter and the amplitude adjuster as taught by Amano into the combined system of Sloan and Ito's so that natural sounding synthesized speeches can be generated (col. 1, lines 65-67).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 16, it is not clear how the decorrelation means is connected to other means inside the noise synthesizer (as recited in claim 3).

Allowable Subject Matter

10. Claims 3-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 16-17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art teaches the artificial reverberation generating device having the convolution between the impulse response synthesizer and the convolution engine

where the impulse response synthesizer comprises a noise synthesizer having, for each of the two or more audio channels, the noise generator, the density generator, the phase correlation means and the filter and amplitude-envelope generator means and their connection as outlined in claim 3.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Phan whose telephone number is (571) 272-6338. The examiner can normally be reached on Monday-Friday (9:00AM-5:30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on 571-272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CURTIS KUNTZ/
Supervisory Patent Examiner, Art Unit 2614

/Hai Phan/
Examiner, Art Unit 2614